

REMARKS

Claims 1-28 remain pending in this application. Claims 1-22 have been amended. New claims 23-28 have been added. No new matter has been introduced by way of the present amendment. Reconsideration of the application is respectfully requested.

In the Office Action, the Examiner objected to claims 7, 8 and 18, 19, but indicated that these claims would be allowable if rewritten in independent form. Claims 7 and 18 have been rewritten in independent form and claims 8 and 18 depend therefrom, respectively. Applicants respectfully traverse the Examiner's objections.

Claims 2-11 and 14-21 stand objected to because of informalities. By this amendment, claims 2-11 and 14-21 have been amended as to matters of form. Accordingly, Applicants respectfully submit that the Examiner's objections of claims 2-11 and 14-21 be withdrawn.

The Examiner rejected claims 11-6, 9-17, and 20-21 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,532,968 (*Lee*). As an initial matter, it appears that by an inadvertent error the Examiner cited the U.S. Patent No. 6,532,958 instead of the U.S. Patent No. 6,532,968 (*Lee*). Applicants respectfully traverse this rejection.

Applicants respectfully assert that *Lee* does not disclose, teach, or suggest all of the elements of independent claims 1, 12, 13, and 22, all as amended. *Lee* refers to a self refresh control circuit for a memory cell array 10. The self refresh control circuit comprises a self refresh mode control circuit 20 and a temperature tracing circuit 30. The temperature tracing circuit 30 generates a voltage variable with the temperature variation and compares the generated

variable voltage with the plurality of the reference voltages from the reference voltage generator 40, respectively. *See* column 4, lines 18-22. Using a temperature controller 32, the temperature tracing circuit 30 selects the desired one of the plurality of self refresh periods from the self refresh mode control circuit 20 in response to a plurality of output signals from a temperature sensor 31, and outputs the selected self refresh period to the self refresh mode control circuit 20. *See* column 4, lines 23-28, and Figure 4. *Lee* also discloses the temperature sensor 31 to include two resistors TVM and TIM that are adapted to divide a voltage difference between the two voltage sources Va and Vb to generate the voltage Vtv variable with the temperature variation. The temperature sensor 31 includes three comparators CP1-CP3 to compare the variable voltage Vtv with the reference voltages Vref1-Vref3 from the reference voltage generator 40 and output the compared results TC1-TC3 to the temperature controller 32, respectively. *See* column 5, lines 36-55.

Lee is directed towards a temperature tracing circuit 30 to generate the voltage Vtv variable with the temperature variation, compare the variable voltage Vtv with the reference voltages Vref1-Vref3, and output the compared results to the self refresh mode control circuit 20 for selecting the desired one of the plurality of self refresh periods. However, *Lee* does not disclose providing a preselected number of times a signal responsive to temperature to adjust a refresh rate in response to the temperature signal being provided the preselected number of times, as called for by independent claims 1, 11, 12, 13, and 22 (all as amended). For example, claim 1 calls for a sensor adapted to provide a signal responsive to temperature, a preselected number of times and a refresh rate control unit being adapted to adjust a refresh rate associated with at least a portion of the device in response to the temperature signal being based on the preselected number of times. All of these elements are not suggested or made obvious by *Lee*.

In fact, *Lee* does not disclose use of a signal responsive to temperature a preselected number of times to adjust a refresh rate. The subject matter of *Lee* is not directed to a refresh rate adjustment based on a signal responsive to temperature that is provided a preselected number of times. Claim 1 of the present invention calls for a sensor adapted to provide a signal responsive to temperature a preselected number of times and a refresh rate control unit being adapted to adjust a refresh rate in response to the temperature signal being based on the preselected number of times. *Lee* does not disclose such a sensor and a refresh rate control unit, and therefore, claim 1 is novel. Thus, claim 1 of the present invention is allowable.

Claim 12 calls for means for detecting a temperature of at least a portion of a memory device to provide an indication of the temperature a preselected number of times and means for adjusting a refresh rate associated with at least a portion of the memory device in response to the detected temperature being based on the indication of the temperature a preselected number of times. For at least the reasons cited above, all of the elements of claim 12 are not disclosed by *Lee* (e.g., *Lee* does not disclose an indication of the temperature a preselected number of times), and therefore claim 12 is allowable since *Lee* does not disclose a adjusting a refresh rate based on the indication of the temperature a preselected number of times. Additionally, claim 13, which calls for a method that includes the step of detecting a temperature of at least a portion of a memory device to provide an indication of the temperature a preselected number of times and the step of adjusting a refresh rate associated with at least a portion of the memory device in response to the detected temperature being based on the indication of the temperature a preselected number of times, is also allowable for at least the reasons cited above. Similarly, claim 22, which calls for a system comprising a sensor adapted to provide a signal responsive to temperature of at least a portion of the memory a preselected number of times and a refresh rate

control unit operatively coupled with the sensor, the refresh rate control unit being adapted to adjust a refresh rate associated with at least a portion of the memory in response to the temperature signal being based on the preselected number of times, is also allowable for at least the reasons cited above.

Newly added claims 23-28, include limitations, which as described above, are novel and are not disclosed by *Lee*. Therefore, new claims 23-28 are allowable. Based upon the amendments and arguments provided herein, independent claims 1, 12, 13, and 22 are allowable for at least the reasons cited above. Additionally, dependent claims 2-6, 9-11, 14-17, 20, and 21 which depend from independent claims 11, 12, 13, and 22, respectively, are also allowable for at least the reasons cited above.

The Examiner rejected claim 22 under 35 U.S.C. § 103(a) as being unpatentable over *Lee* in view of U.S. Patent No. 6,452,845 (*Merritt*). Applicants respectfully traverse this rejection. Applicants respectfully assert that independent claim 22, as amended, is not disclosed, taught, or suggested by *Lee* and *Merritt* either alone or in combination. *Merritt* is generally directed to testing semiconductor electrical devices, particularly memory devices. *Merritt* allows rows and columns of redundant elements in packaged semiconductor chips, such as DRAMs and other semiconductor memory devices, to rapidly undergo testing when in packaged form. By allowing rapid testing to be performed on redundant elements in packaged semiconductor chips, *Merritt* avoids many of the drawbacks of testing unpackaged devices in die form. The processor 52 is connected to the one or more memory devices 100 through a memory controller 62 that provides the appropriate signals to the memory. See column 10, lines 29-32. However, claim 22 (as amended), calls for a memory controller operatively coupling the processor with the memory and

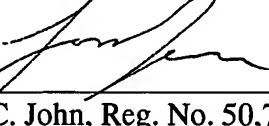
being adapted to control refresh operations of the memory. The memory controller comprises a sensor adapted to provide a signal responsive to temperature of at least a portion of the memory a preselected number of times. Furthermore, the memory controller in claim 22 comprises a refresh rate control unit operatively coupled with the sensor, the refresh rate control unit being adapted to adjust a refresh rate associated with at least a portion of the memory in response to the temperature signal being based on the preselected number of times. **Merritt** is directed towards a memory controller 62 that provides the appropriate signals to the memory. The appropriate signals in **Merritt** are in no way related to controlling refresh operations in the memory. Therefore, claim 22, as amended, is not disclosed, taught, or suggested by **Merritt** and/or rendered obvious over **Lee** and in view of **Merritt** in light of the amendments and arguments provided herein. Accordingly, claim 22 of the present invention is allowable.

As described above, **Lee** does not disclose or make obvious the subject matter of adjusting a refresh rate using the temperature signal based on a preselected number of times, as called for by claim 22. Additionally, **Merritt**, which merely discloses testing of memory devices, does not make up for this deficit. In other words, **Merritt** does not disclose or make obvious adjusting a refresh rate using the temperature signal based on a preselected number of times. Therefore, the combination of **Lee** and **Merritt** does not teach or make obvious all of the elements of claim 22.

Further, those skilled in the art would not combine **Lee** and **Merritt** to make obvious all of the elements of claim 22 of the present invention. **Lee** is directed to adjusting refresh periods. In contrast, **Merritt** is directed to memory testing. The Examiner uses improper hindsight reasoning to selectively cite portions of the disclosures of **Merritt** and **Lee** to make obvious all of

the elements of claim 22. There is no indication of motivation in the cited prior art to prompt those skilled in the art to combine their teaching to render obvious all of the elements of claim 22. Without applying improper hindsight reasoning, those skilled in the art would not combine *Lee* and *Merritt* to make obvious all of the elements of claim 22 of the present invention. However, as described above, even if *Lee* and *Merritt* were combined, all of the elements of claim 22 would not be taught or made obvious. Therefore, the Examiner fails to establish a *prima facie* case of obviousness in light of the amendments and arguments provided herein. Therefore, Applicants respectfully assert that claims 1-28 are now allowable.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Houston, Texas telephone number (713) 934-4069 to discuss the steps necessary for placing the application in condition for allowance.

Date: <u>July 19, 2005</u>	<p>Respectfully submitted,</p> <p>WILLIAMS, MORGAN & AMERSON, P.C. CUSTOMER NO. 23720</p> <p>By: </p> <p>Jaison C. John, Reg. No. 50,737 10333 Richmond, Suite 1100 Houston, Texas 77042 (713) 934-7000 (713) 934-7011 (facsimile) ATTORNEY FOR APPLICANT(S)</p>
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